

24

Notice of Allowability

Application No.

09/974,778

Examiner

Devona E. Faulk

Applicant(s)

KOHUT, PAUL

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application filed on 10/9/2001.
2. ☒ The allowed claim(s) is/are 1-23.
3. ☒ The drawings filed on 09 October 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Reasons For Allowance

1. Claims 1-23 are allowed.
2. The following is an examiner's statement of reasons for allowance: Regarding claims 1,7,12,16, and 17 prior art Daniels (U.S. Patent 5,418,860) discloses a voice coil excursion and amplitude gain control device. Prior art Dal Farra (U.S. Patent 6,201,873) discloses a loudspeaker audio compression system for reducing distortion. Prior art Gelow et al. (U.S. Patent 4,583,245) discloses a speaker system protection circuit. Prior art Cullison et al. (U.S. Patent 4,296,278) discloses a loudspeaker overload protection circuit. Prior art Bonneville (U.S. Patent 5,729,611) discloses a loudspeaker overload protection unit. Prior art Lucey et al. (U.S. Patent 5,448,646) discloses a headset interface having a shaping circuit. The applicant's admitted prior art (Figure 3) discloses a series frequency-dependent excursion limiter circuit. The prior art named above fails to teach of a clamping stage as claimed, a shaping filter as claimed and an inter-stage feedback loop as claimed.

As such, the prior art or combination thereof fails to disclose or make obvious the following:

an excursion limiter circuit comprising a summing stage, a clamping stage following said summing stage providing a voltage clamping function which limits the voltage of the input signal passed through said clamping stage to a predetermined maximum voltage

Art Unit: 2644

substantially independent of frequency, said clamping stage having a clamping stage output, a shaping filter stage following said clamping stage, said shaping filter stage providing a frequency response function based on a predetermined frequency response shaping criteria, and including at least one local feed forward branch filter having a feed forward branch filter output summed with said clamping stage output, and inter-stage feedback loop for providing feedback from the branch filter of said shaping filter stage to said summing stage for providing an inverse frequency response shaping function at said summing stage as claimed in claims 1;

An excursion limiter circuit comprising a summing stage for receiving an input signal, said summing stage including a clamping circuit for providing a voltage clamping function which limits the voltage of the input signal passed through said summing stage to a predetermined maximum voltage substantially independent of frequency, said summing stage having a summing stage output, a shaping filter stage following said summing stage, said shaping filter stage providing a frequency response shaping function based on a predetermined frequency response shaping criteria, and including at least one local feed forward branch filter having a feed forward branch filter output summed with said summing stage output, and an inter-stage feedback loop for providing feedback from the branch filter of said shaping filter stage to said summing stage for providing an inverse frequency response shaping function at said

Art Unit: 2644

summing stage which is the inverse of the frequency response shaping function provided by said shaping filter stage as claimed in claim 7;

An excursion limiter circuit comprising a summing stage having an summing stage input, a summing stage output, a summing stage node, and a voltage clamping circuit for clamping the voltage at the summing stage output at a predetermined clamping voltage level, a shaping filter stage input connected to the output of said summing stage, and further having a shaping filter stage output, a shaping filter stage summing node, and a local feed forward circuit from said shaping filter stage input to said shaping filter stage summing node, said shaping filter stage including at least one branch filter having a branch filter output in the feed forward circuit of said shaping filter stage, said shaping filter stage being designed to provide a frequency response shaping function based on a predetermined frequency response shaping criteria related to the frequency dependent excursion limits of the transducers being protected and an inter-stage feedback circuit connected from the branch filter output of the branch filter of said shaping filter stage of the input summing node of said summing stage for providing feedback to the summing stage for providing an inverse frequency response shaping function at the summing stage which is the inverse of the frequency response shaping function provided by said shaping filter stage as claimed in claim 12;

An excursion limiter circuit comprising a summing stage having a summing stage having an summing stage input, a summing stage output, and a summing stage summing node, a clamping stage following said

Art Unit: 2644

summing stage for providing a voltage clamping function which limits the voltage of the input signal passed through said clamping stage to a predetermined maximum voltage substantially independent of frequency, said clamping stage having a clamping stage output, a shaping filter having a shaping filter stage input connected to the output of said summing stage, and further having a shaping filter stage output, a shaping filter stage summing node, and a local feed forward circuit from said shaping filter stage input to said shaping filter stage summing node, said shaping filter stage including at least one branch filter having a branch filter output in the feed forward circuit of said shaping filter stage, said shaping filter stage being designed to provide a frequency response shaping function based on a predetermined frequency response shaping criteria related to the frequency dependent excursion limits of the transducers being protected, and an inter-stage feedback circuit connected from the branch filter output of the branch filter of said shaping filter stage to the input summing node of said summing stage for providing feedback to the summing stage for providing an inverse frequency response shaping function at the summing stage which is the inverse of the frequency response shaping function provided by said shaping filter stage as claimed in claim 16; and

A method for protecting transducers from mechanical overload from a driving signal comprising providing an input for the driving signal, clamping the driving signal to a predetermined maximum voltage which is substantially independent of frequency if said driving signal

Art Unit: 2644

exceeds said predetermined maximum voltage, after clamping, passing the driving signal through a shaping filter stage which provides a frequency response shaping function based on a predetermined frequency response shaping criteria related to the frequency dependent excursion limits of the transducers being protected from mechanical overload, and providing feedback from the shaping filter stage to the driving signal input to provide an inverse frequency response shaping function at said input which is the inverse of the frequency response shaping function provided by said shaping filter as claimed in claim 17.

Claims 2-6 are allowable due to dependency on claim 1.

Claims 8-11 are allowable due to dependency on claim 7.

Claims 13-15 are allowable due to dependency on claim 12.

Claims 18-23 are allowable due to dependency on claim 17.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 703-305-4359. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 703-305-4040.

Art Unit: 2644

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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SUPERVISORY PATENT EXAMINER

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